

Light, Heat & Electricity

Grade 4

Teacher's Guide



Lake Erie Nature & Science Center

Description

In this hands-on, inquiry based field trip, students will experiment with heat, light and electricity to explore energy transformation.

Length: 60 minutes. **Adult chaperones recommended:** 4-6

Content Standards

Subject	Gr	Standard	Objective/"I can" Statements
Physical Science	4	<ul style="list-style-type: none">• Energy transfers from hot objects to cold objects as heat, resulting in a temperature change.• Electric circuits require a complete loop of conducting materials through which an electrical energy can be transferred.• Electrical energy in circuits can be transformed to other forms of energy, including light, heat, sound and motion.• Electricity and magnetism are closely related.	<ul style="list-style-type: none">• I can identify materials that are conductors of heat and electricity• I can identify materials that are insulators of heat and electricity• I can discuss and define parts of a circuit• I can explain the purpose of a switch in a circuit

Pre-Trip Activities

Measure the temperature of water. Recognize that an increase in temperature indicates an increase in heat energy and a decrease in temperature indicates a decrease in heat energy.

Vocabulary

insulator
conductor
circuit

Book

- Can You Feel the Force? By Richard Hammond. DK Publishing, 2006.

Post-Trip Activities at School

- Have students draw a circuit map of the lights in their classroom.
- Discuss how energy converts to heat, causing the warming of devices such as phones and computers.

Extension Activities

- Use Bare Conductive paint to have students draw their own working circuits on paper.
- Discuss the importance of roof color and road color as acting as an insulator or conductor.
- Electrical Conductors, an interactive simulation from BBC Schools, allows students to explore different materials and classify them as electrical conductors or insulators.
- It also emphasizes that a complete loop of conductors is needed for a circuit to be complete. The optional sections that deal with adding bulbs and batteries are not aligned with this content statement.
- Identify different types of energy conversions within an electrical circuit.
- Use ESFI.org to teach about electrical safety
 - <http://files.esfi.org/file/ESFI-Electricity-Printouts.pdf>

Other Resources:

<http://files.esfi.org/file/ESFI-Electricity-Printouts.pdf>